Change in Word Prosody: Stress and Quantity

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Abstract and Keywords

Although changes in stress systems are not as meticulously described and discussed as other aspects of phonology, they are recorded in the historical literature. Stress is related to quantity and weight and any change thereof may lead to an alteration of stress patterns. Usually, a change in the direction of stress assignment is rare, although abrupt changes from left-edge to right-edge stress or vice versa are known to happen. Causes for such changes are frequently assumed to be rooted in language contact. This chapter argues that stress patterns are surprisingly pertinacious, and that universal metrical preferences and constraints govern possible and impossible prosodic shifts. Rather than external influence alone, the chapter argues that acquisition and learnability can account for the data more coherently. It first considers general issues in the change of stress parameters and then focuses on the history of English, to exemplify some possible types of change on the basis of the prosodic changes that have occurred in that language.

Keywords: stress change, phonological quantity, prosodic opacity, parametric change, history of stress, English

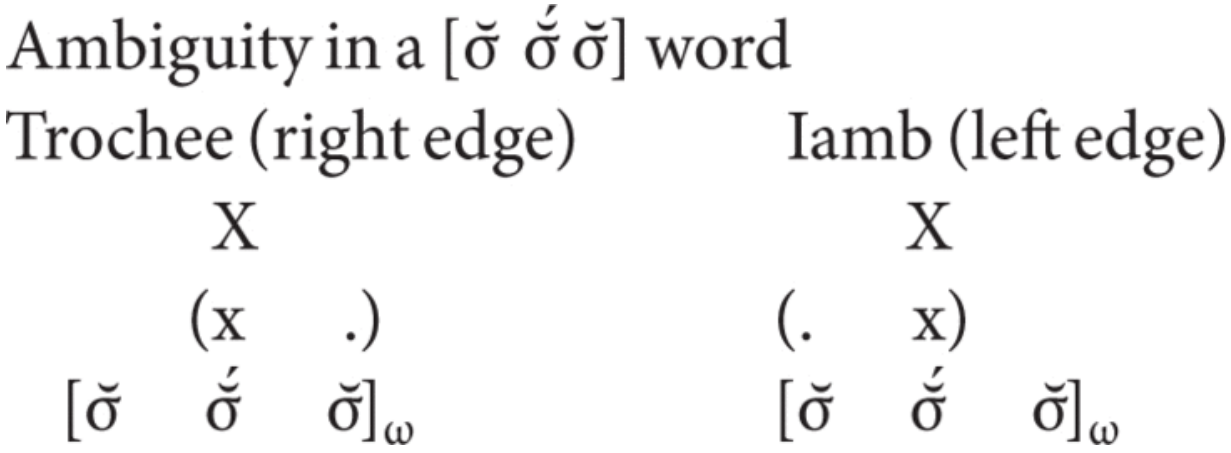
15.1 Introduction

DIACHRONIC data has become consistently more relevant to models of linguistic structure. However, segmental developments dominate phonological discussions compared to word prominence and stress, and stress systems are generally less meticulously described and discussed. Textbooks rarely index changes in stress or metrical systems, although related phenomena like quantity and weight may be discussed at length. In this chapter, we address change in stress systems under the broader perspective of *prosody,* meaning all aspects of phonological grammar that relate to phonological quantity, syllable structure, foot structure and stress.[1] While prosodic changes are principally phonological, they can be affected by morphological structure as well. Phonological properties of affixes and phonological domains that result from root-cum-affixes affect prosodic organization. For instance, an affix may provide a domain which would trigger shortening, dele-

tion or gemination and have serious prosodic consequences (cf. English suffix {-ity} triggers Trisyllabic Shortening as in *sane~sanity*, or OE causative suffix /j/ which causes gemination *tem-j-an* > *temman* 'to tame'). Alternatively, a difference in stress organization may express differences in morphological categories, as in *torménт*$_{\text{VERB}}$ ~ *tórment*$_{\text{NOUN}}$.

Analyses of synchronic phonological systems make a case for assuming that assignment of stress is part of a complex system of metrical organization rather than the realization of emphasis on a particular vowel. Metrical organization includes foot construction, assembling syllables into feet, and edge prominence. An alteration in any one part may lead to a change in the entire system. A major difficulty in understanding (p. 220) prosodic change is that even if the outward realization of stress has not changed, the underlying prosodic organization may have changed. A trisyllabic word, with a sequence of three light syllables, bearing main stress on the middle syllable, could be analysed as a trochaic or an iambic pattern, with an initial or final unfooted syllable. The ambiguity is due to the fact that this prominence could be obtained depending on whether the foot is aligned to the right or the left edge of the word, as in (1). Only a larger data set can determine the real organization.

(1)



Motives for sound change are diverse, as explored in many chapters of this volume, especially articulatory, acoustic and/or auditory ones (see especially Donegan & Nathan, Bybee, and Blevins, all this volume) and phonological ones (see especially Dresher, Purnell, & Raimy, and Kiparsky, all this volume). For word prominence, however, uncertainties of articulatory and acoustic correlates of stress make it more difficult to directly relate stress change to phonetic causes alone. It is equally difficult to reliably compare the phonetic correlates of stress differences between dialects. Nevertheless, native listeners are aware of prosodic differences across dialects, and orthoepists, then and now, have recorded certain fixed patterns of what (they think) they heard.

This chapter highlights the consequences of normal language transmission through generations, interacting with language contact and the nativization of loans leading to prosodic reorganization. For any change of stress pattern to become part of the phonological grammar, the underlying prosodic system must reorganize, or else the shift will be unstable. Lahiri (2002) and Dresher & Lahiri (2005) drew attention to a characteristic of

grammars called *pertinacity*. A rule or pattern may persist over time, though its realization may change. This type of pertinacity can be summed up as *same pattern, different output realization*. A converse kind of pertinacity exists where output forms persist despite changes in the grammar, which involve a reanalysis of the output form, triggered by changes elsewhere in the system. This type of pertinacity can be summed up as *different pattern, same output realization*. Since learners acquire their grammars guided by the output forms they are exposed to, we do not expect these forms—especially those that make up the 'core' or 'primary' data—to change in the course of acquisition.[2] Reanalysis of grammar that does not involve an immediate change in output forms is thus a significant type of language change. Changes in stress systems are prime examples of both types of pertinacity.

(p. 221) Word stress is not merely a matter of locating the syllable which carries maximum prominence. Word prosody implies metrical organization composed of independent, but interrelated parameters. A description of the parameters that provide underlying metrical organization enables us to provide a typology of possible types of word-prosodic change. In section 15.4, we draw data specifically from Old English (OE) to Middle English (ME), drawing attention to the overarching principle of *pertinacity* which constrains language learners from making abrupt changes.

15.2 Stress Parameters

In languages where word stress is significant, every word has one main stress, typically aligned with one edge of a word. Stress contrasts predictably require more than one syllable to be discernible. The term 'phonemic' stress usually implies that minimal pairs exist which contrast only in stress, e.g. *pérmit*$_{\text{NOUN}}$ ~ *permít*$_{\text{VERB}}$ or German *áugust* ~ *Augúst* 'proper name ~ month'. Languages with 'fixed' stress allow a specific syllable at one edge of a word to bear main stress; for example, in Bengali and Finnish main stress falls always on the initial syllable, while word-final stress is typical for French or Turkish. However, even in languages where stress can occur more 'freely', main prominence is restricted within a three-syllable window at a word edge. Main stress in the middle of a word would be fortuitous in the sense that this may happen only when the centre of a word converges with an edge. In a five-syllable word like *univérsity*, stress falls on the middle syllable, the third-syllable from either edge (cf. Hayes 1995). As we shall see, the preference in English happens to be the right edge of a word.

Although stress prominence appears on a syllable, the organization of stress patterns involves a larger constituent, the *foot*. Metrical feet group syllables together based on organized principles and are the best means of characterizing stress patterns. Complex stress patterns are difficult to account for without metrical organization, particularly when words carry secondary stresses. For instance, *còriánder* and *aspáragus* have four syllables each, but main stress falls on different parts of the word and only the former has secondary stress. The pattern can be accounted for by assuming that *(còri)(án)der* has two feet, with main stress on the right foot while *a(spára)gus* has only one.

Thus, we need to distinguish factors such as syllable quantity and weight, a typology of feet, and principles for grouping syllables into feet. The correlation between a syllable's internal structure and its weight is language dependent, but in languages where syllable weight plays a significant role, syllables with long vowels and closed syllables usually count as heavy.[3] Headedness (which edge of the foot is strong) allows for two (p. 222) types of feet, left-headed trochees and right-headed iambs (2a).[4] Two further considerations are necessary in grouping syllables into feet, direction of parsing (2b) and the word-edge which is most prominent (2c). An additional factor necessary in some languages is the potential inertia of a final prosodic constituent (2d).[5] These are summarized in (2).

(2)

Stress parameters

(a)	Foot type:	Trochee/Iamb
(b)	Foot direction:	Right-to-Left / Left-to-Right
(c)	Main Stress:	Right/Left
(d)	Extrametricality:	Yes/No

In what follows, we show that a change in any of these parameters need not necessarily produce a difference in surface prominence. Only a subset of words in a language provides the critical evidence for setting the parameters. For instance, on the basis of a word such as *húrricàne* one cannot determine whether the foot type in English is an iamb or a trochee, since there are two feet each of which is a heavy syllable. After reviewing proposed foot types, we show how differences in parameter settings may or may not reveal surface differences and how identical surface stress patterns may be analysed by different parameters. We argue that these are precisely the type of situations which may lead to a change in metrical organization.

In quantity-sensitive systems, ideally feet are asymmetric such that the head of a foot is always aligned to a heavy syllable. However, if only light syllables are available, then these would be grouped into feet as well.

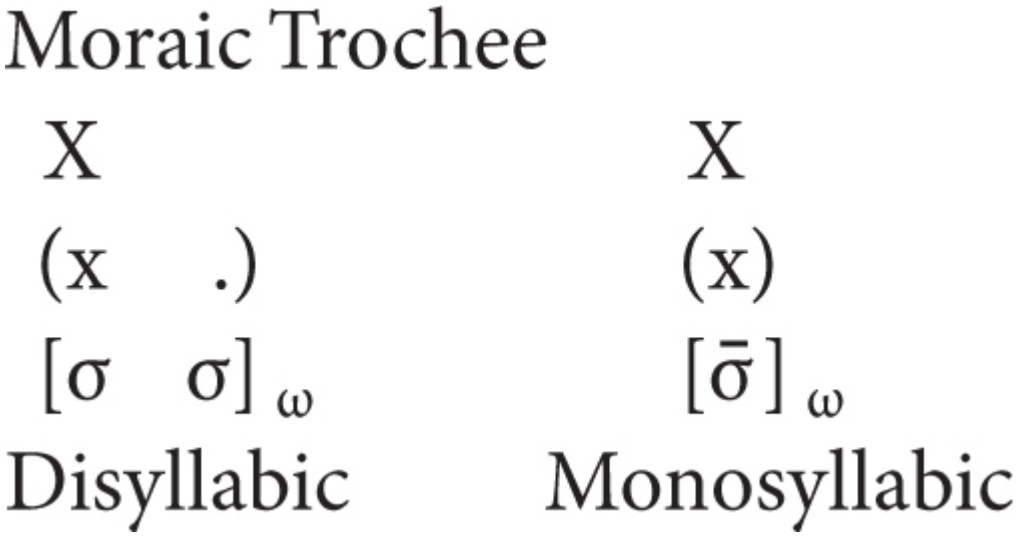
(3)

Quantity sensitive Trochees and Iambs

Trochees		Iambs	
(x .)	(x .)	(. x)	(. x)
[σ̄ σ] ω	[σ̆ σ̆] ω	[σ σ̄] ω	[σ̆ σ̆] ω

Other than the basic foot types in (3), evidence supports some variation in the above claims.[6] A moraic trochee as suggested in Hayes (1995) is not asymmetric; i.e. if the head of the foot is bimoraic, then the foot itself must consist only of one syllable.

(p. 223) **(4)**



The difference between an asymmetric trochee and a moraic trochee can be seen by grouping sequences of light (L) and heavy (H) syllables into feet as in (5). The first three words from the left are parsed identically, but the last two show marked differences. (d) has two feet under the moraic trochee analysis but one foot in the asymmetric grouping. As for (e), both allow two feet with identical prominence patterns, but in the moraic trochee analysis the medial light syllable remains unfooted, which may have different consequences if such syllables are reduced or deleted.

(5)

Variations in trochees

(i) Asymmetric Trochee (as in 3)

(a)	(b)	(c)	(d)	(e)
(x .)	(x)	(x .)	(x .)	(x .) (x)
[L L] ω	[H] ω	[L L L] ω	[H L L] ω	[H L H] ω

(ii) Moraic Trochee

(x .)	(x)	(x .)	(x) (x .)	(x) (x)
[L L] ω	[H] ω	[L L L] ω	[H L L] ω	[H L H] ω

With identical feet, the direction of parsing can lead to crucial differences in grouping. (6) illustrates a series of parsing possibilities with the aid of moraic trochees and iambs. A word with a [HLL] sequence shows identical grouping for both moraic trochee and iamb irrespective of the direction of parsing. However, for the other words, we find major differences.

(6)

Direction of parsing

(i) Moraic Trochee - Right to Left

(x .) (x)	(x) (x .)	(x) (x .)
[L L L H L]$_{\omega}$	[H L L]$_{\omega}$	[H L L L]$_{\omega}$

(ii) Moraic Trochee - Left to Right

(x .) (x)	(x) (x .)	(x) (x .)
[L L L H L]$_{\omega}$	[H L L]$_{\omega}$	[H L L L]$_{\omega}$

(iii) Iamb - Right to Left

(. x) (. x)	(x) (. x)	(x) (. x)
[L L L H L]$_{\omega}$	[H L L]$_{\omega}$	[H L L L]$_{\omega}$

(iv) Iamb - Left to Right

(. x) (. x)	(x) (. x)	(x) (. x)
[L L L H L]$_{\omega}$	[H L L]$_{\omega}$	[H L L L]$_{\omega}$

(p. 224) Consequently, identical sequences of heavy and light syllable words may reveal different foot structures following a change in the direction of parsing, but not always. Sequences like [LLLHL] or [HLL] are insufficient to determine accurately the direction of parsing for an iamb. These are just the sorts of circumstances where the language learner will have different options for parsing a subset of the data. If the crucial piece of data is not available, the learner can opt for a different analysis than the previous generation, leading to change. For instance, when faced with two stresses on a word with a sequence of [HLL], the learner could deduce an iambic foot where the direction of parsing could be from either direction. If the learner opts for left-to-right (6iv) even if the correct analysis was right-to-left (6iii), and continues to generalize the pattern on a [HLLL] word, she would incorrectly fail to assign a stressed foot on the final syllable.

The third parameter is more straightforward in the sense that it is limited to assigning main stress, either on the right or left word-edge. If we consider the parsing data with an iamb as in (6iv), we can see how the choice of edges will contribute to different main stress.

(7)

Choice of word edge for main stress

Iamb - Left to Right: Main Stress Right

X	X	X
(. x) (. x)	(x) (. x)	(x) (. x)
[L L L H L] ω	[H L L] ω	[H L L L] ω

Iamb - Left to Right: Main Stress Left

X	X	X
(. x) (. x)	(x) (. x)	(x) (. x)
[L L L H L] ω	[H L L] ω	[H L L L] ω

If a consonant, syllable or even foot is not included in the parsing, this invokes extrametricality. In Latin, it is essential to assume an extrametrical final syllable, since stress assignment entirely ignores the structure or weight of this syllable, as in (8). We also add the basic pattern for English nouns where again an extrametrical syllable is apparent.

(8)

Extrametricality in Latin and English

Latin: Moraic Trochee, Right to Left, Main Stress Right, Final syllable extrametrical

X	X	X	X
(x .)	(x)	(x)	(x) (x)
[L L <H>] ω	[H L <H>] ω	[L H <H>] ω	[H H <H>] ω
mí ni <mus>	múr mu <ris>	re féc <tus>	in cű <dis>

English nouns: Moraic Trochee, Right to Left, Main Stress Right, Final syllable extrametrical

X	X	X	X
(x .)	(x)	(x)	(x) (x)
[L L <L>] ω	[H L <H>] ω	[L H <H>] ω	[H H <H>] ω
mí ni <mum>	cón so <nant>	e líp <sis>	ar thrí <tis>
minimum	*consonant*	*ellipsis*	*arthritis*

(p. 225) The stress parameters not only provide the means of describing metrical patterns in languages, but allow us to determine expected types of changes. As we have seen, a single parameter is insufficient to provide the range of patterns that may exist in a language. The interaction of several parameters allows us to determine the actual patterns. Even then, only a subset of words point to the correct set of parameters for a given language. A pattern such as [ŏŏŏ] is not enough to tell us whether the foot is a trochee or an iamb. Thus, a change in a single parameter will not affect all words, only a subset. The next section lays out the types of opacity of stress patterns, which may lead to a change in the metrical organization of a language. Since stress changes are closely related to weight, we examine possible modifications in syllable quantity and weight. We focus on two conflicting ways systems may or may not change: different metrical patterns, same output realization *versus* different output realizations but with similar metrical patterns.

15.3 Opacity in Stress Systems

Opacity can occur in stress systems in two ways; many words can have ambiguous metrical interpretations, or the same underlying pattern persists, but due to other interacting processes, surface variation arises. We discuss each in turn.

Same output, different grammars:

a typical example where numerous words maintain the same prominence pattern for generations, which is eventually reinterpreted as a different rule, occurred in Latin.[7] Pre-Classical Latin is assumed to have had stress on the *left* edge, while Classical Latin as we have seen above, clearly prefers stress on the *right* edge. The opposite happened in Bengali, where Old Bengali preferred stress on the *right* edge, while Modern Bengali stress is reminiscent of Proto-Germanic with stress strictly assigned to the *left* edge. With the available parameters one might argue that these are clear instances of a change in where the main stress falls. If we consider the Latin examples in (8) and only change *Main Stress Left* to *Main Stress Right* keeping all other parameters constant, what would be the outcome?

(9)

Hypothetical early Latin parameters with *Main Stress Left*

Other parameters: Moraic Trochee, Right to Left, Final syllable extrametrical

(i)	(ii)	(iii)	(iv)
X	X	X	X
(x .)	(x)	(x)	(x) (x)
[L L <H>]$_{\omega}$	[H L <H>]$_{\omega}$	[L H <H>]$_{\omega}$	[H H <H>]$_{\omega}$
mí ni <mus>	múr mu <ris>	re féc <tus>	†in cű <dis>

(p. 226) Comparing (8) and (9), only in one example is the main stress different when the *Main Stress* parameter changed; main stress in *incūdis* shifted from the leftmost foot (9iv) to the right in Classical Latin, but the other words are stressed exactly as before since

they only have one foot. This makes sense in a scenario with two feet and two stresses, possibly adjacent. The native speaker has difficulty in deciding which is the main prominence, particularly if stress clash occurs within phrases triggering variation. For example, main stress on *thirtéen* can shift to the first syllable in the phrase *thírtèen mén* due to a clash in stress. Such alternations may lead to a shift in the main-stress alignment, which could have happened in Latin.

The same surface patterns can be produced by two different underlying metrical systems. The surface evidence of the *Main Stress* parameter is restricted to certain types of words, namely those that have more than one foot, and when the change occurred, it must have resulted from ambiguity in words with two feet. In fact, the change is quite minor involving a decision as to which foot to give more prominence to when a word has more than one.

An alteration in any of these parameters may lead to a stress shift in only a few words and not others; Latin would be an example where many words maintain exactly the same surface forms although the underlying pattern has changed. Consequently, to deduce the stress parameters correctly, the language learner requires sets of unambiguous words. This is difficult since many words in our lexicons could be accounted for by various stress parameters. Consider the words in (10). A learner faced with these stress patterns could easily opt for any of the four sets of parameters given below.

(10)

Different parameters eliciting identical stress patterns

'L L L	L 'H L	'H H	'H L H
prósody	*agénda*	*bándage*	*cónsonant*

	(i)	(ii)	(ii)	(iv)
Extrametricality	Final syllable	Final syllable	None	Final syllable
Foot Type	Moraic Trochee	Moraic Trochee	Moraic Trochee	Moraic Trochee
Direction of Parsing	Right to Left	Left to Right	Left to Right	Right to Left
Main Stress	Left	Right	Left	Right

All four options give the correct stress patterns in these words. The disambiguating example we need is a word like *América*, with the pattern [L'LLL]. The only option that covers the full range of data is (10iv). Thus, the possibilities of change are many. If three groups of learners came up with a separate option based on the first set of words, and if they resisted changing the pattern despite the newer data, or if they never come across the new data, then their dialects will differ from their parents, giving the same outputs with different underlying grammars.

Same grammar, different outputs:

a different problem arises when the same underlying system persists, but different surface realizations can occur. This occurs particularly when other word prosodic changes (such as changes in syllable quantity) intervene. Metrical (p. 227) structure governing stress is sensitive to the number and weight of syllables. The latter is sensitive to vowel

and consonant length and the internal structure of syllables. All may change independently of stress, which in turn influences a change in foot structure.

More languages contrast vowel than consonant length, but the older Germanic languages show both vowel and consonant quantity contrast. For example, OE nominal stems were of the following types: CVC, CV̄ C, CVC_aC_a, CVC_aC_b.

(11)

Syllable structure of OE monosyllabic nominal stems

dæg	mūs	webb	word
'day'	'mouse'	'web'	'word'

Interestingly, the contexts in which vowels and consonants are lengthened or shortened appear to differ. The most frequent context for vowel lengthening or shortening is prosodic: *closed syllable shortening, open syllable lengthening,* and variations therein. In contrast, consonantal lengthening or gemination is often due to some process of assimilation.

A frequent type of gemination occurs when a consonant is followed by a sonorant, leading to complete regressive assimilation, as in the Latin data in (12). In West Germanic, the suffix or stem extension /j/ triggered gemination if the preceding syllable was light, as in the West Germanic data in (12).

(12)

Gemination contexts

Latin	/n/ + /l,r/ > /l:, r:/				
	in-legal > *illegal*, in-regular > *irregular*				
West Germanic	(approximation)	V̆jCV̆	>	V̆C:V̆	(C≠*r*)
	OE	cyn j es	>	cynnes	kin-GEN
	OHG	kun j es	>	kunnes	

Our interest is in the effect of gemination on foot structure. After gemination, the medial long consonant invariably closes the preceding syllable, and if a closed syllable counts as heavy, the foot structure changes among other effects. Compare the nouns with original H H stems in OE, which belong to two different stem classes, *a*-stem and *ja*-stem respectively; only *wēsten* is subject to gemination because it has a stem extension /j/.[8] As a result of gemination, the second syllable in *wēstenne* becomes heavy, ending with a long consonant, with immediate consequences for foot structure (Dresher & Lahiri 1991).[9]

(p. 228) **(13)**

OE nouns with two heavy syllables and gemination

(i)	cīcen			H H	'chicken.NOM.SG.'
(ii)	wēsten(n)			H H	'desert.NOM.SG.'
(iii)	cīcen - e	>	cīcene	H L L	'chicken.DAT.SG.'
(iv)	wēsten -j - e	>	wēstenne	H H L	'desert.DAT.SG.'

OE foot structure (cf. fn 9) with destressing of the final non-branching foot (underlined H)

(a)	(b)	(c)	(d)
X	X x	X	X
([x] .)	([x])([x] .])	([x]) ([x])	([x])([x])
[H L L]ω	[H H L]ω	[H H]ω	[H H]ω
cī ce ne	wē sten ne	cī cen	wē sten
cī́cene	wḗstènne	cī́cen	wḗsten

In OE, secondary stress is blocked on non-branching feet (13c,d). The critical result of gemination in (13iv) leads to an HHL sequence, while (13iii) maintains an HLL sequence. Demoting the final non-branching foot has equal effect on the nominative singular forms (13c,d), but the dative singular forms suddenly differ. The word *wḗstènne* (13b) keeps its secondary stress on the second syllable while (13a) carries only main stress. Consequently, gemination had a direct consequence on the surface stress pattern distinguishing two classes of nouns, which were exactly parallel before gemination. Thus, the underlying foot structure remains, but surface realizations have changed.

The other side of the coin is degemination, which converts a geminate into a singleton. An obvious context for degemination is when another consonant follows, as in OE: *fyll-an* 'to fill-INF', *fyll-d-e* > *fylde* 'to fill-PAST-INDICATIVE.1P,3P'*; cyss-an* 'to (p. 229) kiss-INF', *cyss-d-e* > *cyste* 'to kiss-PAST-INDICATIVE.1P,3P' (Lahiri 2009). Degemination can, however, occur without any obvious syllabic context; most modern Germanic languages have lost original geminates: *cyss* is still written with two fricatives but pronounced as [kɪs]. Although degemination led to the loss of quantity, the metrical structure was not affected. A German example shows this: the word *Küsse* 'kiss-PL' now consists of two light syllables

(LL) rather than an HL sequence when gemination was present, but main stress has remained on the initial for centuries.

Shortening and lengthening a stressed vowel can have similar consequences. Perhaps the best example of shortening and the effect on the overall stress pattern comes from Trisyllabic shortening (TSS). In (14), the OE words have the structures HHL and HLL, where the first word has two feet while the second has only one. TSS has the effect of shortening the first stressed vowel (Lahiri & Fikkert 1999).

(14)

Trisyllabic Shortening (TSS) and Metrical shortening from Old to Middle English (in TSS, a stressed long vowel is shortened when preceding two unstressed syllables)

Old English	(i)	lā́verke	(ii)	cī́cene
Foot structure		([H])([H]L)		([H] L) L
TSS		([L H] L)		([L L] L)
Middle English		láverke		cícene
		lark		*chicken*

Although OE words already tended to be short, they could have more than one foot and carry two stresses as in *ő́þèrne*. After shortenings such as TSS, native English words with two feet tended to be no longer than a single foot, like *láverke* and *cícene*. Again the metrical structure itself has not changed, but surface realizations have.

The opposite of TSS was open syllable lengthening (OSL) which applied to most West Germanic languages (Lahiri & Dresher 1999). However, interacting with TSS, OSL had no substantial effect on trisyllabic words: *láverke* > OSL *lăverke* > TSS *láverke*. But disyllabic words did show a lasting effect as in the long initial vowel in words like *naked, beadle, beacon*, such that an original LH word would become HL after OSL and final consonant extrametricality. Again, lengthening did not have an immediate effect on stress, but moved words towards a much preferred trochaic foot.

Consequently, any change in consonant and vowel quantity directly influences syllable structure, which in turn may affect the number of feet in a word.[10] Nevertheless, as in these instances where surface realizations of words have changed, the underlying metrical pattern can remain consistent despite the increase or decrease in the number of feet. (p. 230) Thus, many forces are at play within a given language without any outside interference, which may trigger changes only in a part of the system while the rest of the grammar remains constant. There are, however, outside influences as well which may play a role in initiating change and we turn to these next.

15.3.1 Interpretation of Surface Opacity and Language Contact

As we have seen, individual stress patterns of words do not always lead to an unambiguous answer as to which parameters are crucial for determining the metrical system of a language. The surface stress patterns of the words in (10) could be accounted for with different parameters, and only an addition of a fifth word with a particular sequence of syllables, allowed us to choose between the options. The surface opacity makes it quite clear that the data relevant for setting parameters from generation to generation is vulnerable to change. Yet rarely do native speakers change their prosodic patterns and we are very sensitive to non-native stress patterns.

There is, however, the additional issue of language contact.[11] A significant change in most Germanic languages is the shift of main stress to the right edge of a word from earlier left-edge prominence, and the general claim is that contact with Romance languages is to blame. How does this happen? If adult native speakers are so sensitive to non-native patterns, how do foreign patterns not only become absorbed, but actually trigger substantial changes? Recall that the Germanic shift is the reverse of the change from pre-Classical Latin to Latin where left-edge prominence moved to the right edge (cf. (9)). As noted, monopedal words remained ambiguous to the setting of the edge parameter; main stress on the rightmost or leftmost foot gave the same results. The shift must have occurred in words with two feet, and some of which could be adjacent.

Consider two scenarios that may lead to prosodic change—reanalysis of the system due to opacity *vs* influence from a different metrical system. Recall that metrical change involves a change in one or more parameters and occurs when native speakers encounter data which are ambiguous in terms of certain parameters (i.e. same surface pattern, different metrical systems). But speakers are conservative and pertinacious in maintaining underlying systems. Loans or internal prosodic changes in quantity can lead to changes in surface realizations, but without changing the system. Thus there is always a conflict between *surface change, but same grammar* versus *surface same, but different grammar.* To examine how these conflicting scenarios actually interact, we take English as a case study to trace how and why the shifts occurred, in section 15.4. We propose the sequence of events in (15) (see footnote 9 for the Resolved Moraic Trochee).

(p. 231) **(15)**

Approximate dates of change in metrical structure from Old English till 1660

Foot: Resolved moraic trochee throughout
Extrametricality: OE none, from late OE final syllable
c. 1400: Foot direction *left*, Main stress *left*
c. 1530: Foot direction *right*, Main stress *left*
c. 1660: Foot direction *right*, Main stress *right*

15.4 Case Study: Change in the Stress System of English

Three aspects of modern English stress are rather different from early English patterns and require explanation: (i) the shift of stress from word-initial position in some loans while maintaining the stress pattern of native words; (ii) absorbing stress-affecting affixes, and (iii) the introduction of noun-verb doublets alternating in stress. As we will see, Romance loans did not come in carrying the stress of the donor language. We will argue that the shift occurred in stages; neither French nor Latin patterns were absorbed without alteration.

15.4.1 Stress in Old English

While there is complete consensus that Proto-Germanic stress fell on the left edge, with some modifications, most synchronic accounts of modern Germanic (Icelandic being the exception) would agree that word prominence tends to be on the right edge. This represents a radical change in some words, but not others as shown in (16).

(16)

Proto-Germanic to Modern Germanic

(i) PGmc stress pattern: main stress on leftmost syllable irrespective of syllable weight

Ĺ L H̀ L Ĺ H L Ĺ L L Ĺ H H H́ L L

(ii) Modern Germanic languages (approximation): main stress on penultimate syllable if heavy

L̀ L H́ L L H́ L Ĺ L L L H́ H H́ L L

The diachronic scenario given above was described by Lahiri, Riad, & Jacobs (1999) as a change from the *Resolved Moraic Trochee, Left-to-Right, Main Stress Left* to the modern languages with *Moraic Trochee, Right-to-Left, Main Stress Right*. Scholars differ on (p. 232) details, but the overall sequence remains the same. In this section, we sketch the story for English, relying on Dresher & Lahiri (2005) and Fikkert, Dresher, & Lahiri (2006). Although undoubtedly Latin and Old French loans did have an effect on English stress, the change in the parameters did not happen all at once. Parameter changes went stepwise, the foot direction changing first, followed by main stress prominence shifting to the right.

15.4.2 Old English to Early Middle English

The OE foot, or *Germanic Foot*, is an expanded (resolved) moraic trochee (cf. footnote 9) where the head must contain at least two moras and the dependent at most one. The two moras of the head need not come from the same syllable. As we have seen that not all

surface forms provide evidence for metrical structure, examples are given in (17), varying in syllable structure and weight (Dresher & Lahiri 1991).

(17)

Old English: Resolved Moraic Trochee (the head of the foot is indicated by [])

([x])	([x])	([x] .)	([x] .)	([x] .)
[L L] ω	[H]ω	[L H L] ω	[L L L] ω	[H L] ω
lo fu	word	fæ rel d**u**	we ru da	wor d**u**
(a) *lofu*	(b) *word*	(c) *færeld*	(d) *weruda*	(e) *word*

([x] .) ([x])	([x]) ([x] .)	([x] .)	([x])([x])
[H L H] ω	[H H L] ω	[H L L] ω	[H H] ω
hé́a f**u** des	ó́ þèr ne	nī́ te nu	ó́ þer
(f) *hé́afdes*	(g) *ó́þèrne*	(h) *nī́tenu*	(i) *ó́þer*

In (17e), the initial heavy syllable has two moras and occupies the head of the foot; the second syllable is light (one mora), and occupies the dependent branch. In (17d), the initial syllable is light, and so the second light syllable joins it (a process called *resolution*) to make up the head position of the foot. The third syllable occupies the dependent position. (17c) is similar, except resolution is with a heavy syllable. Two light syllables may form a foot, but it is non-branching as in (17a).

Evidence for the resolved foot also comes from syncope processes like *High Vowel Deletion*, which deletes high vowels in the weak branch of the foot. In the examples above, only the double underlined [u] are deleted. Thus, since the word-final [u] in *nītenu* is not in the dependent branch of the foot, it survives, while the [u]s in *hé́af**u**des* and *word**u*** are deleted, yielding *hé́afdes* and *word*. The final high vowel in the non-branching foot of *lofu* is not deleted.

What concerns us here are the stress patterns. In Old English, main stress falls on the leftmost foot. However, not all subsequent feet bear secondary stress; (p. 233) only *branching feet* can bear secondary stress. This is indicated by an underlined H-syllable, which marks non-branching non-initial feet. Thus, *héafdes* and *óþer* have only one stress, while *óþèrne* bears secondary stress. The lack of secondary stress on a word-final non-branching foot, is in effect, defooting and has the consequence of making the final closed syllable light. This is a significant change because, in effect, the final consonant is now being interpreted as extrametrical, as shown in (18).

(18)

Interpretation of de-footing as final consonant extrametricality

([x] .)	([x]) ([x] .)	([x] .)	([x] .)
[H L L]$_\omega$	[H H L]$_\omega$	[H L L]$_\omega$	[H L]$_\omega$
héa fu de<s>	ó þèr ne	nī te nu	ó þe<r>
(a) *héafdes*	(b) *óþèrne*	(c) *nītenu*	(d) *óþer*

We have seen before that another process which affected quantity, during the transition from Old to Middle English, is Trisyllabic Shortening (TSS), already applicable in OE. As in (14), the interaction of these rules led to a metrical shortening such that OE words that had more than one foot were reduced to a single foot in ME: OE *lā̆ vèrke,* ME *láverke*.

(19)

Metrical shortening with TSS

OE	(i) *héringes	(ii) *láverke	(iii) cícenes	(iv) clávere
Defooting	([H])([H])([H])	([H])([H]L)	([H] L)([H])	([H] L)L
Extrametricality	([H])([H] L)	—	([H] L) L	—
TSS	([L H] L)	([L H] L)	([L L] L)	([L L] L)
ME	héringes	láverke	cícenes	clávere

The changes sketched above had no effect on the position of main stress, and the stress system in early ME remained essentially as in OE. However, TSS did metrically ‘shorten’ words and with the addition of final consonant extrametricality, many words that had more than one foot in OE were reduced to a single foot in ME (Lahiri & Dresher 1999: 709). Although OE words already tended to be short, they could have more than one foot and carry two stresses as noted already for *óþèrne*. Following defooting and further metrical shortenings, native English words tended to be no longer than a single foot, like *láverke* and *cícenes*.

OE suffixes were, as their descendants still are today, ‘stress neutral’, suggesting that they did not participate in the stress domain and main stress always fell on the first syllable, indicative of compound stress: *frḗondscipe*. Nothing until now suggests that there was data to prompt a shift in directionality or position of main stress. In the eleventh to twelfth century, the phonological system faced an onslaught of French borrowing after

the Norman Conquest. French loans poured in, and one could imagine that the ground (p. 234) was fertile for a change in stress, as claimed in early generative accounts like Halle & Keyser (1971).[12]

15.4.3 Stress in Chaucer c.1400—Language Contact

According to Halle & Keyser (1971), in addition to a Germanic stress rule, a Romance stress rule was added to English around Chaucer's period.[13] The new rule incorporated two different patterns in Chaucer:

(20)
Stress patterns that should be covered by the Romance Stress Rule
(a) French pattern responsible for Chaucer's final stress in words with final tense vowels like *honóur* and *citée*
(b) Latin pattern responsible for stress on the penultimate syllable if heavy (*engéndred*), otherwise on the antepenult (*Zépherus*)

Their storyline is that this rule originally competed against the dominant OE stress rule, and was gradually extended over subsequent centuries. The relatively few early borrowings from Latin were secured by a much larger number of French words with the French stress pattern. This is possible under such an analysis, since the French and Latin stress rules are united. The later (*c*.1650) onslaught of Latin borrowings provided further evidence for a pattern that had already gained a foothold in English.

This appears to be flawed in several respects. First, under any analysis, Latin and French stress rules are dissimilar enough to yield quite different patterns. Second, the French pattern has no lasting effect on English prosody. Third, the Latin stress pattern, as distinct from the French pattern, is hardly attested in Chaucer. We consider each in turn and argue that Romance loans had little effect during Chaucer's period.

The stress rules of Latin and French are indeed rather different and should yield different stress patterns.

(21)
The French stress rule
(a) Final vowel (tense or lax) is stressed unless it is schwa: *abbót, seculér, sectíon, opportún, honóur;*
(b) Otherwise, the penultimate vowel is stressed: *opposíte, divíne, Egípte, exíled, govérne, servíce, baréyne*

(p. 235) **(22)**

The Latin stress rule

(a) A tense (not lax) final vowel is stressed: *chanóun, degrée, honóur, vertú;*

(b) Otherwise, the penultimate syllable is stressed iff it is heavy (i.e. either it has a tense vowel or is closed by a consonant): *Caríbdis, divíne, govérne, Neptúnus;*

(c) Otherwise, the antepenult is stressed: *Cappáneus, Týdeus, Zépherus.*

One major difference is the treatment of final syllables. Latin does not permit word-final stress unless the word ends with a tense vowel while French prefers final stress unless there is a word-final schwa. Consequently, for the words in (23) French and Latin stress rules would give different patterns. The words in (23a) have to be marked as exceptions to the unified Romance stress rule.

(23)

Disylllabic words with different French and Latin stress patterns

(a) French: *abbót, Jhesús, Judíth, Oréb, tempést*

(b) Latin: *ábbot, Jhésus, Júdith, Óreb, témpest*

Another inconsistency occurs in words with more than two syllables, where the final vowel is schwa and the penultimate syllable is light. Here, the French rule would give penultimate stress, while Latin has antepenultimate stress. Halle & Keyser claim that Old French words all had heavy penults, thus avoiding a conflict in words borrowed from that source, but many words borrowed into English from Latin had light penults and followed the Latin, not the French rule, undermining a unified approach to Old French and Latin stress patterns.

A second difficulty is that the French stress pattern has had no lasting effect on English prosody. Words with French stress in Chaucer could have been stressed according to the native English pattern, as required by the meter.

(24)

Chaucer's metrical doublets (Halle & Keyser 19971: 103)

(a) *Fúl wél shĕ sóong the* sérvĭcĕ *dyvyne* (A.Prol.122)

(b) *Lóo, hów thĭs théef koude hĭs* sĕrvícĕ *béedĕ* (G.C.Y. 1065)

A word like *service* could receive word-initial or penultimate stress. The final *e* must have been pronounced, else the lines would lack the requisite number of syllables. In (24a), it must have three syllables and bear initial stress. No other stress assignment is possible in this word since an odd position can be occupied by a stressed syllable only when it is not adjacent to unstressed syllables on both sides. In contrast, in (b) stress must fall on the penultimate syllable. Hence we find doublets in Chaucer such as *citée ~ cítee, comfórt ~ cómfort, divérs ~ díverse, Plató ~ Pláto, presént ~ présent,* etc. With few exceptions, the

present day English reflexes of Romance words with French stress in Chaucer have initial stress consistent with Germanic stressing, such as *ábbot, bárren, cíty, cómfort, Égypt, fórtune, gíant, góvern, hónour, Pláto, sérvant, sólemn, témpest, tórment* (noun), *vírtue, sérvice, sécular, séction*.

(p. 236) Furthermore, in many modern English words stress has been retracted from the final syllable as in Chaucer: *ascéndant* (cf. *ascénd*, Chaucer *ascendént*), *cánon* (Chaucer *chanóun*), and *purvéyance* (cf. *purvéy,* Chaucer *purveyáunce*; the more usual ME form was *púrvey-*). The few exceptions to the generalization are *degrée, divíne,* and *rewárd* with final stress (see below).

Thus, in general, Romance loans borrowed before the fifteenth century have initial stress in Modern English irrespective of the weight of the initial syllable (Svensson & Hering 2003), as shown in (25).

(25)

Romance loans with initial stress before 15th century

(a) Stem vowel is short in Modern English (from Dresher & Lahiri 2005)
alcove, *talent* (893), *baron* (1200), *senate* (1205), *jealous* (1250), *palace* (1290), *channel* (1300), *gallon* (1300), *panel* (1300), *coral* (1305), *profit* (1325), *metal* (1340), *satin* (1366), *moral* (1380), *volume* (1380), *second* (1391), *Latin* (1391)

(b) Stem vowel is long in Modern English
basin (1220), *moment* (1240), *vacant* (1290), *odour* (1300), *process* (1330), *paper* (1374), *raisin* (1382), *patent* (1387), *famous* (1400).

Today, many early and late trisyllabic loans bear initial stress. These words may once have been longer. Examples include *báttery* (c 1500), *cápital* (1290), *ópera* (1648), *énemy* (c 1340), *crócodile* (c 1300), *érudite* (c 1425), etc.[14] In contrast, disyllabic Romance loans with final stress in English, which went entirely against any OE stress pattern, tend to have been borrowed much later: *canal* (1449), *bourgeois* (1564), *gazelle* (1582/1700), *moustache* (1585), *gazette* (1605), *hotel* (1644), *champagne* (1664), *salon* (1715), *bouquet* (1716), *brochure* (1765), *beret* (1850), *taboo* (1777), *mirage* (1800). There are, however, dialectal differences and some of these words are pronounced with initial stress in British English: *bourgeois, salon, brochure, beret, mirage*. Indeed, certain words which have final stress nowadays had initial stress earlier as *cement* (1300) where ME *síment* had initial stress until the nineteenth century, or *antique* which was identical in pronunciation to *ántic* until the eighteenth century. For the month *July*, final stress can be traced back to Johnson's period.

A third problem is that the Latin stress pattern, as distinct from the Old French one, is hardly attested in Chaucer. If, as argued, the Latin stress pattern is distinct from that of Old French, evidence for the introduction of a Latin-type stress rule into English in Chaucer's time must rest on words that exemplify this pattern. However, such words are

rather rare in Chaucer, and tend to be Latin names. Halle & Keyser cite the following instances (p. 99).

(26)

Latin-type stress in Chaucer
Antepenultimate if penultimate is light: *Căppáněŭs, Týděŭs, Zéphěrŭs*
Else penultimate: *Căríbdĭs, Sătúrnĕs*

(p. 237) We conclude that there is no clear evidence that either the Old French or the Latin stress rule gained a foothold in English at the time of Chaucer (see also Minkova 1997, Redford 2003, and compare Ratliff, this volume, on the care that needs to be taken when invoking contact as a cause for change in a prosodic system). Our hypothesis is that early loans were originally borrowed as morphologically simplex (we follow Lahiri & Fikkert 1999, also Minkova & Stockwell 1996). Thus, *reverence* was not initially derived from *revere*, nor *austerity* from *austere*. This accounts for the stress patterns of these words, and provides evidence that direction of parsing and placement of main stress had not changed before 1530. Further evidence comes from words that exhibit so-called 'Medial Laxing' where the stressed vowel in the verb is unstressed and short in the noun.[15] In these medial-laxing pairs, the 'derived' forms have stress consistent with the OE pattern, firmly secure in the initial syllable, and moreover are often borrowed earlier than the base form.

(27)

Medial Laxing ('underived' ~'derived')
abstain (1380) ~ *abstinence* (1300); *confide* (1455) ~ *confidence* (1430); *reside* (1460) ~ *resident* (adj.) (1382); *finite* (1493/1597) ~ *infinite* (1385); *potent* (1500) ~ *impotent* (1390): *preside* (1611) ~ *president* (1375); *revere* (1661) ~ *reverence* (1290).

If these pairs were not really morphologically related when they were borrowed, why do the 'underived' forms (typically verbs) bear stress on the second syllable? Recall that this pattern is consistent with the native model of unstressed prefixed verbs. The only non-initial stress in OE was found in prefixed verbs: *forbḗodan* 'to forbid', *becúman* 'to become', *fullfýllan* 'to fulfill'. Furthermore, as Halle & Keyser point out, pairs like *bîgang*$_{\text{NOUN}}$ ~ *begángen*$_{\text{VERB}}$ 'practice ~ to practice' are very much part of the OE system (also see footnote 13). In all probability, loans such as *revére* could be treated as if they had unstressed prefixes.

Thus, most ‘derived’ words that came into the language during Chaucer’s period and earlier were borrowed as indivisible wholes. Only later was the derivational relationship established. For the fifteenth-century native speaker the underlying stressed vowels in *reverence* or *president* were short, and the first syllable of the ‘derived’ forms (typically nouns) in (27) were part of the stem and not treated as affixes. Thus, despite loans and variable surface realizations, the stress parameters in early ME remained largely the same.

(28)

Stress parameters around 1400

Foot	Resolved moraic trochee
Extrametricality	Consonant
Foot direction:	Left to Right
Main stress	Left

(p. 238) 15.4.4 Change in Direction of Parsing (c 1570)

Old English words tended to be short and suffixes were, as their descendants still are today, stress neutral. With metrical shortening, native words tended to be no longer than a single foot. Therefore, evidence for setting the parameters of directionality and main stress was in short supply. The loans in the preceding section show that it was not sufficient to borrow Latin words to provoke a change in directionality. What led to this change?

Following Danielsson (1948), Poldauf (1981), and others, we associate this change with the introduction of words with Latin suffixes such as *-able/-ible,-ation,-ic(al),-ity,-ator,* etc., each of which could be a foot on their own and behaved like original compounds where the second element would bear stress: *brȳdgùma* 'bridegroom', *dǽ gsèage* 'daisy'. However, the absorption of these words was still not straightforward as we can see from the sixteenth and seventeenth century literature. Peter Levins's *Manipulus Vocabulorum*, printed in 1570, is perhaps most important for the study of change in stress patterns in English. It is a reverse (rhyming) dictionary, indicating the location of stress. Although Levins lists many words that appear to have stress on the right edge, a fairly large number do not conform to a straightforward Latin stress rule.

(29)

Levins's stress patterns

non-initial			initial		
FINAL	PENULT	ANTEPENULT	4σ	4,5σ	3σ
quarrél	*oriéntal*	*antíquitie*	*hóspitable*	*dívisible*	*túrpentine*
lamént	*advénture*	*infírmitie*	*prósperity*	*délectable*	*défective*
debáte	*recógnise*	*memórial*	*ádolescencie*	*nóminative*	*cánonise*
flagón	*conféssour*	*agréeable*	*précipitate*	*téstamentary*	*mármalad*

Levins's remarkable list leaves little doubt that initial stress was very much present even in this period. To account for these patterns, Halle & Keyser evoke a stress retraction rule since their Romance stress rule would normally always provide stress on the right edge; thus, the Romance stress rule would predict *canoníse*, requiring stress retraction to give the main stress at the left edge, *cánonise*. As we have seen, little evidence suggests that the earlier loans had any effect on the stress parameters of English and no Romance rule was in evidence in the mid 1400s. A century later, when many more words had come into the language, the stress parameters seem to require some adjustment.

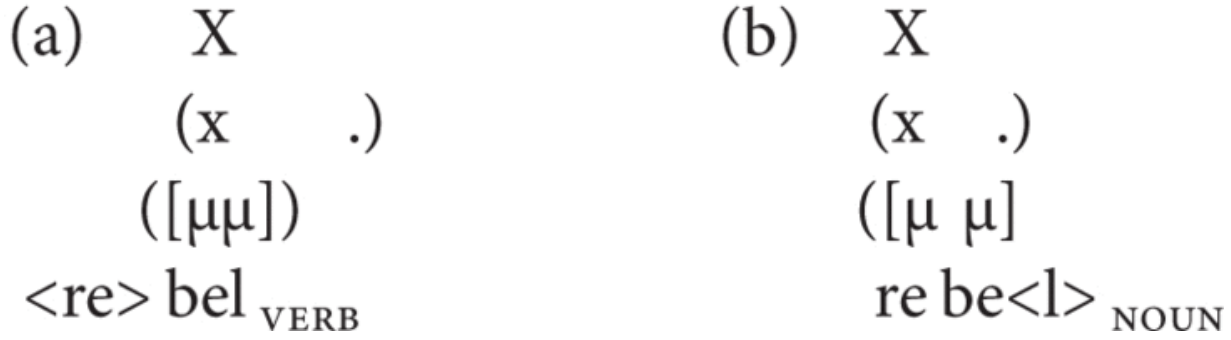
What appears to be happening is that native speakers of English continue their Germanic nominal/verbal distinction, where initial light syllables of verbs are treated as prefixes. We can deduce four notable facts from Levins's dictionary. First, when (p. 239) disyllabic verbs are marked with final stress, the first syllable continues to function like a prefix: *depúte, recórd, contráct, rebél, quarrél, rewárd*. Four corresponding nouns have initial stress, suggesting that this analysis is on the right track: *députe, rébel, quárrel, récord*. Second, suffixes like *-ity, -ible/-able, -ate* were not following 'normal' Romance stress rules. Indeed, there are no words in *-ory* which do not have word-initial stress. Third, in comparison to verbs, very few disyllabic nouns bear final stress: *flagón*. Fourth, there has been a substantial increase in longer verbs ending in non-schwa vowels due to the suffixed loans: *-ory, -ate, -ity*.

Which parameters changed during Levins's period? During the earlier period, morphologically complex words were always coming in as simplex forms, as is typical for borrowing crosslinguistically. This appears to have continued in the sixteenth century, during the early Shakespearean period. Consequently, suffixed words with *-ible/-able, -ity* were treated as monomorphemic. Nevertheless, unlike the earlier period where all words like *admirable* and *residence* bore initial stress, there are some exceptions and one begins to find surface alternations like *húmidity* versus *antíquity*. Without doubt there is still a very strong main stress parameter associated with the left edge. However, during the mid sixteenth century we begin to see three interacting reanalyses taking place.

First, and most important, we perceive the onset of morphologically governed stress alternating doublets in the synchronic grammar: nouns *rébel, quárrel*; verbs *rebél, quarrél.* This was a consequence of borrowed verbs being stressed on the root (parallel to *forgíve*), thereby strengthening the number of unstressed prefixes. The pattern is, however, not novel. Old English did have doublets, where the noun was derived from the verb, but with clear quantity distinction in the related prefixes: *bī ~ be, ánd ~ on*. Prefixed disyllabic noun and verb pairs occurred, where the verb was derived from the noun: *ándswaru* 'answer' *~ ándswarian* 'to answer', but these would always carry stress on the same syllable. What was new in Levins were doublets with stress differences as *tórment*$_{\text{NOUN}}$ *~ torménT*$_{\text{VERB}}$. Thus, the existing OE prefix-extrametricality for verbs increased.

(30)

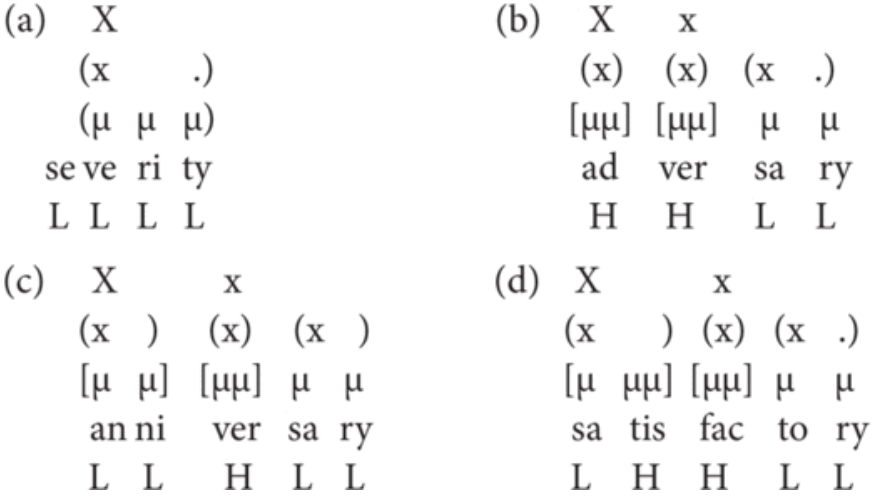
Noun~verb pairs in Levins



The second factor is that although it is highly likely that as before most suffixed nouns came in underived, we do not systematically find word-initial stress as in Chaucer's *réverence*. Words with initial stress like *précipitate, bárbarity* need to be contrasted with *fratérnity, infírmity*. A careful look at the data suggests that despite a preference for the left edge, the parameter that has changed is the direction of parsing, which now begins from the right edge.

(p. 240) **(31)**

Levins's parameters: Germanic Foot, Direction *right*, Main stress *left*; non branching secondary feet are defooted



In (32) we can directly compare the parameters around 1400 with those proposed for Levins. Main stress is aligned to the left of a word.

(32)

Main and secondary stress with foot direction left (OE) versus foot direction right (Levins)

	(a)	(b)	(c)	(d)	(e)
OE	(Ĺ L L) L	(Ĺ L) (H̀ L)	(Ĺ H) (H̀ L) L	(Ĺ H L)	(Ĥ L) (L L)
Levins	Ĺ (L L L)	(Ĺ L) (H̀ L)	(Ĺ H) (H̀) (L L)	Ĺ (H L)	(Ĥ) (L̀ L L)

The two sequences which differ in main stress are (32a,d). The pattern in (32d) is largely found in verbs such as *recognize, fraternize,* or in affixed words beginning with light syllables which have a prefix-like structure such as *agreeable, fraternal,* etc. To establish the foot direction, however, the pattern in (32a) is critical. A further point is that additional support for the continuing existence of resolution, i.e. LX=H, comes from the lack of secondary stress on final feet in (32c,e), neither of which can bear stress since the feet are not branching.

Final superheavy syllables increase slightly, including ones with final long vowels. English ears would have been unfamiliar with these words and consequently the option was either to use straightforward Germanic stress (word-initial) or lexicalize them with final

stress, which happened during Shakespeare's time (*flagón, turmóil, survéy*), but they reverted to initial stress as the native system prevailed. A few instances of final long vowels are becoming acceptable.

15.4.5 After Levins: the 'Countertonic Principle' and Syllable Extrametricality (*c.*1790)

It was not sufficient to borrow Latin words to provoke a change in main stress although the directionality parameter changed. The noun-verb alternations continued to (p. 241) stabilize, marking the prefix as extrametrical. As Cooper (1768: 113) notes, 'some nouns by translating the Accent are changed into verbs', continuing with pairs like *réfuse ~ refúse, tórment ~ torménT*.

Nevertheless, initial stress remains rather stable. According to Lowe's *Critical Spelling Book* (1755), stress was prescribed on initial syllables in words like *ácademy, cónfessor, délectable* rather than *acádemy, cónfessor, deléctable,* which shows a strong mid-eighteenth century preference for the left edge. Danielsson (1948) attributes to Walker (1791) the observation that classical words were pronounced in English with alternating secondary stresses (e.g. Latin *àcadémia*). When 'Englished', the tonic and countertonic changed places to conform to English 'speech habits' (e.g. *ácadèmy*). The *Countertonic Principle* shows that the main stress parameter remained set to *left* for some time after the change of directionality to *right*. The addition of words stressed according to the Countertonic Principle would have *increased* evidence for main stress *left*. Thus, a word like *ácadèmy* clearly shows two feet, of which the left has main stress.

What was the next parameter change? Halle & Keyser point to the differences between Levins's period and that of John Walker (1791), who also wrote a pronunciation dictionary:

(33)

Four syllable word-stress (based on Halle & Keyser)

	*c.*1570	*c.*1791
Levins/Walker	Levins	Walker
ádversary	*réfractory*	*refráctory*
sédantary	*ánniversary*	*annivérsary*
cónsistory	*péremptory*	*perémptory*

Words like *ádversary* were stressed in the same way while others like *refráctory* had shifted to the antepenultimate syllable. Levins, as noted above, had only initial stress in words with *-ory/-ary*. Halle & Keyser argue that the words in the first column are derived by the

early stress retraction rule, pulling the stress to the first syllable, but that those in column 3 are lexically stored.

We should consider some other examples before coming to any conclusion about changes in parameters. Consider the words in (34).

(34)

Further words from Walker - two, three and four syllable words

cástigate	*invéstigate*	*confíscate*	*vácate*

Halle & Keyser also drew attention to words like *confíscate,* stressed on the penultimate in Shakespeare (born six years before Levins's book was published), but not in Levins. Walker, in contrast to Levins, has a much larger number of words where stress falls on the penultimate in trisyllabics. Furthermore, in four syllable words, we see consistently different patterns between Levins and Walker. This variation between three and four syllable words sets the stage for a reanalysis in the treatment of the final syllable. Unlike Levins, where the left edge was clear except for prefix-like words, it is not clear how to differentiate *cónsistory* (4σ) and *confíscate* (3σ) in terms of an unstressed prefix analysis. (p. 242) Nevertheless, main stress left remains strong, given that words like *ádversary* and *cónsistory* still bear stress on the left edge.

This was the onset of final syllable extrametricality. First, many of the words in (33) could also be accounted for by assuming the final syllable to be extrametrical, and hence would have had no surface change. Recall that secondary stress did not appear on the third foot of words like *ádvèrsary* and hence the final syllable played little role in stress assignment. Second, the deviations between Walker and Levins largely depend on the internal structure of disyllablic suffixes. The head of the foot on the suffixes *-ory* or *-ary*, bore no stress, and so the initial vowel of the suffixes *-o* or *-a* would very easily have been reduced to schwa. If so, syllable extrametricality was almost inevitable for the next generation. Compare the Levins-Walker words in (35).

(35)

Foot direction *right*, Main stress *left*, (Levins)

(a)

X		
(x)	(x .	
[μ μμ]	[μ μ]	
re frac	to	ry

(b)

X			
(x)	(x .		
[μμ]	[μμ]	μ	μ
ad	ver	sa	ry

Foot direction *right*, Main stress *left*, *final syllable extrametrical* (Walker)

(c)

X		
(x)		
μ	[μ μ μ]	μ
re frac	to	<ry>

(d)

X			
(x)	(x .		
[μμ]	[μμ]	μ	μ
ad	ver	sa	<ry >

Walker and Levins also differed as to the main stress in *anniversary*: Levins had main stress on the initial syllable while Walker stressed the antepenultimate syllable. Note that with the stress parameters that Walker had, he would have obtained two feet, and as he was a proponent of making the words 'English', he would have used his countertonic principle and obtained *ánnivèrsary*.

A further ambiguity now arises for the foot type which was still a resolved trochee during Levins's period; otherwise *réfractory* and *sátisfactory* would not have borne main stress. During the end of the eighteenth century with the onset of extrametricality, the foot type also becomes opaque and a moraic trochee analysis would also work for Walker. Clearly, however, the main stress still appears to be on the left edge, as words like *ádversary* suggest. In such cases, the same words that provoked a change of directionality to *right* reinforced the evidence for main stress *left*.

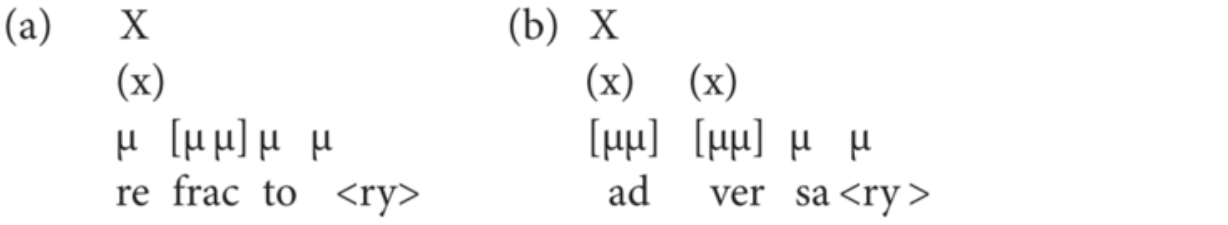
15.4.6 Main Stress Right

The turning point must have been right after the onset of syllable extrametricality when the resolved trochee also became opaque. Probably as in the shift from the left edge to the right edge in Classical Latin, words with two feet were ambiguous for main stress. (p. 243) Words like *ádvèrsary* and *sátisfàctory* had two feet and therefore two stresses. In running speech, if stress clash occurs, main stress would shift to the right rather than the left edge. Second, some trisyllabic loans lost their final vowel and ended up with final stress, like *bazaar* from earlier *bazaroo*. Third, suffixes such as *-ade, -ee, -eer, -esque, -ette, -oon*, became more established, adding to sets of words with two feet. Though words like *càscáde, cànnonér* may have entered the language earlier, they may not have systematically had final stress until a later date. In (36) compare Walker's pattern using a regular moraic trochee with main stress on the right edge where it is invariably the words with two feet that diverge.

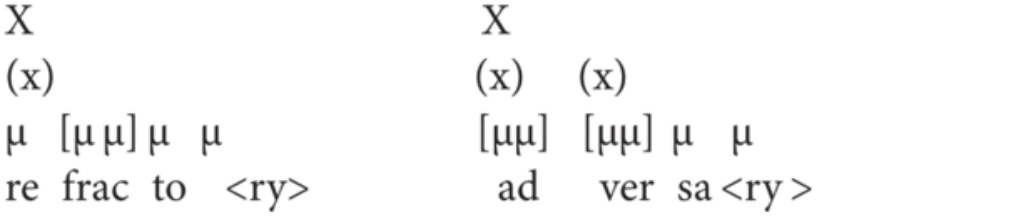
(36)

Main stress left versus right

Walker: Foot direction *right*, Main stress *left, final syllable extrametrical*



Foot direction *right*, Main stress *right, final syllable extrametrical*



Despite hundreds of years of loans, the urge to keep a foot at the leftmost edge remains as we see in many new loans such as *Tìconderóga* (Hayes 1981). The changes in the parameters were step-wise and it is off the mark to suggest that English moved abruptly from a ‘Germanic’ to a ‘Romance’ stress system.

15.5 Conclusion

Although changes in stress systems are not as well described or widely discussed as other aspects of phonology, we can still trace their history. Historical data for metrical organization include verse, as well as records of orthoepists, and for reconstruction we rely on comparative evidence. The lacunae within historical linguistics, where changes in metrical systems remain unreported, are probably related to the fact that stress changes are rarer than segmental modifications. Native speakers are very sensitive to ‘non-native accent’ and incorrect stress placement. Thus, any change in word stress from one generation to another must be subtle and discrete, since speakers are pertinacious in maintaining their grammar. The question remains: how do such systems change?

Word stress is not merely prominence on a single syllable or vowel; rather, it emerges as a combination of several parameters, such as foot type, quantity sensitivity, direction (p. 244) of foot parsing and word edge preference for main stress. Moreover, extrametricality determines whether any particular prosodic constituent at word edge plays an active role in setting the parameters. Change in any one parameter may lead to an alteration of stress patterns but it may affect only a small portion of words. The reverse also holds; the same surface stress pattern may be the result of different parameter settings. Consequently, any change in stress systems is rather complex and, indeed, stress patterns are surprisingly pertinacious, and universal metrical preferences and constraints govern possible and impossible prosodic shifts. Even under external influence, acquisition and learnability appear to be necessary factors.

Again, how does a parameter change? We drew attention to a characteristic of grammars called *pertinacity*. A rule or pattern may persist over time though its realization changes. An example is the persistence of a particular metrical pattern in a language, though it may apply to new forms and no longer apply to forms that it used to apply to. As a case study we argued that the Germanic Foot continued over a long period. This type of pertinacity can be summed up as *same pattern, different output realization*. There is a converse kind of pertinacity where output forms persist despite changes in the grammar. Such changes involve a reanalysis of the output form, provoked by changes elsewhere in the system. This type of pertinacity can be summed up as *different pattern, same output realization*. Since learners acquire their grammars guided by the output forms they are exposed to, we do not expect these forms—especially those that make up the ‘core’ or ‘primary’ data—to change in the course of acquisition. Reanalysis of grammar that does not involve an immediate change in output forms is thus a significant type of language change. Changes in stress systems are prime examples of both types of pertinacity.

Notes:

([1]) For a different approach to the prosodic issue of syllable structure in diachrony, see Mailhammer et al., this volume.

([2]) Foulkes and Vihman's chapter on first language acquisition suggests that change in acquisition is not as common as some have argued. This is not incompatible to our point of view because, to a large extent, they are concerned about change in observable outputs.

([3]) This may not always be the case (Hayes 1995) and not even geminates are always heavy. In Malayalam, it has been claimed that syllables closed by geminate consonants are light while other closed syllables are heavy (Mohanan & Mohanan 1984). Controversy also exists with ambisyllabic consonsants which were historically geminates as in German and Dutch; some claim that these contribute to weight while others do not.

([4]) Feet are assumed to be binary and unparsed syllables remain unfooted.

([5]) The reverse of extrametricality is catalexis where a prosodic constituent is added rather than subtracted from the foot structure. Thus, a catelectic mora or syllable would be a syllable without any segmental information which could be added to the edge of a word to construct a well-formed foot.

([6]) The metrical approach to stress was pioneered by Liberman & Prince (1977 et seq.), and other approaches include Kager, Hayes, Halle, & Vergnaud, Halle & Idsardi. We take Hayes (1995) as a reference point for ease of exposition. A valuable compendium of research material on word prosody of European languages is van der Hulst (1999). For modern Germanic stress patterns, see the following: English (Chomsky & Halle 1968, Kager 1989); German (Wiese 1996); Dutch (Kager 1989, Booij 1995, Trommelen & Zonneveld 1999).

([7]) Jacobs (2000) proposed an asymmetric (rather than moraic) trochee for Latin stress.

([8]) The textbook context is that light syllable followed by /j/ would geminate the coda consonant: cyn+j+e > cynne. However, OE gemination is more complex and is constrained by foot structure (cf. Lahiri 1982, Fikkert et al. 1994). If a light syllable is part of the head of the foot, it does not geminate: æþel+j+e > æþele and not *æþelle. The lengthening syllable need not bear main stress, as we see in wēsten+j+e > wēstenne.

([9]) A variant on the trochee proposed for Germanic by Dresher & Lahiri (1991, 2005 Lahiri & Dresher 1999) is a resolved trochee, where the head must dominate *at least* two morae. Consequently, it behaves like the usual quantity sensitive trochee, but if the first syllable is light, the second will be included in the head. Such a foot is only possible when parsing *must* begin from the initial syllable. (A) compares parsing possibilities grouping syllables from the left edge of a word.

((A))

Resolved Moraic Trochee: the head of the foot is indicated within square brackets

([x])	([x])	([x] .)	([x] .)	([x] .)	([x] .)	([x])
[L L]$_{\omega}$	[H]$_{\omega}$	[L H L]$_{\omega}$	[L L L]$_{\omega}$	[H L]$_{\omega}$	[H L	H]$_{\omega}$

Other than stress, evidence for the variations in prosodic structure come from segmental rules sensitive to metrical feet, like foot-based vowel deletion or epenthesis. Our goal is not to defend our analysis against others, but to point out that if a particular foot type can be motivated for an earlier period, any change in its formation will be reflected in the metrical organization in a later period. Different analyses have been proposed by Idsardi (1994) to these facts; although technicalities differ, the essential pattern remains the same, namely that resolution leads to LX=H. Dresher & Lahiri propose the same foot for Gothic to account for Sievers' Law, claiming a different syllabification pattern for Cj clusters than Murray & Vennemann (1983), which affects foot structure. Kiparsky (2000b) also has a different analysis when accounting for Sievers' Law. Crucially it is impossible to determine how the proposed constraints in Kiparsky (2000b) can lead to initial stress, high vowel deletion or secondary stress in Old English. Thus, even if the Sievers' Law analysis works, it does not account for the OE data.

([10]) The reverse also holds, in the sense that constraints on syllable structure can lead to a change in vowel and consonant quantity. An example is the OE nominalizing suffix *-þ* which formed nouns from adjectives: *streng-þ* 'strength', *fȳl-þ* 'filth', *þīef-þ* 'theft'. Later, English developed a constraint of closed syllable shortening, which affected all superheavy stem syllables and words with suffixes which were closely attached to the stem leading to vowel shortening: *filth, theft*. This also affected some verbs with original long vowels whose regular past tense suffix was then reinterpreted as a *-t*, leading to a vowel alternation: *cēpan* 'keep', *cēp-te; keep, kept*.

([11]) Similar issues are discussed in Eckman & Iverson (this volume), with reference to Second Language Acquisition and Uffmann (this volume) with reference to Loanword Adaptation (including a discussion of the adaptation or maintenance of stress in loanwords), and see also Ratliff (this volume) for a consideration of the role of contact in tonogenesis.

([12]) The next section develops and expands the analysis in Dresher & Lahiri (2005).

([13]) Halle & Keyser's (1971) rule for OE was essentially initial stress, combined with a *Stress Retraction Rule,* which retracted the stress from the final syllable to the initial syl-

lable for prefixed nouns like *ándgiet* (pp. 89–91). The latter was justified under the assumption of a derivational pattern like: $\{and+gíet\}_{VERB} > \{ánd+giet\}_{NOUN}$.

([14]) The dates are from the *OEED (Oxford English Etymological Dictionary)*.

([15]) These words are problematic and treated as exceptions in all current analyses, including Liberman and Prince 1977 (morphological shortening), Kiparsky 1979 (sonorant destressing), Myers 1987 (medial laxing), and Kager 1989 and Gussenhoven 1994 (lexical exceptions).

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